

1
Claims:

1 1. A compostable and/or degradable polymer
2 composition, comprising:

3 polymer (A) which is a polyesteramide copolymer;
4 polymer (B) which is at least one polymer selected from
5 the group consisting of polyethylenevinyl alcohol, polyvinyl
6 alcohol, polyester, starch, starch derivative, cellulose,
7 polyethylene glycol, chitin, amylose, amylopectin, starch
8 derivatized with ethyleneimine, cellulose derivatized with
9 ethyleneimine, polysaccharides derivatized with
10 ethyleneimine, lignin derivatized with ethyleneimine,
11 farinaceous materials derivatized with ethyleneimine and
12 mixtures thereof;

13 component (C) which is a plasticizer; and

14 component (D) which is a crosslinking agent;

15 wherein the polymer composition comprises 0 to 60 wt%
16 of polymer (B), 0 to 25 wt% of component (C), and 0 to 5 wt%
17 of component (D);

18 wherein all wt% values are based upon the total weight
19 of the polymer composition; and

20 with the proviso that the polymer composition must
21 contain at least one of polymer (B) and component (D).

1 2. The compostable and/or degradable polymer
2 composition according to claim 1, wherein the amide content
3 is 80 to 20 wt% of the polyesteramide copolymer.

1 3. The compostable and/or degradable polymer
2 composition according to claim 1, wherein the ester content
3 is 20 to 80 wt% of the polyesteramide copolymer.

1 4. The compostable and/or degradable polymer
2 composition according to claim 1, wherein polymer (A) is
3 prepared from at least one of the following sets of
4 reactants:

5 i) cyclic amide, dicarboxylic acid or ester and
6 aliphatic diol;

7 ii) aliphatic polyamide and a cyclic ester, a diol
8 or both;

9 iii) aliphatic diamine, dicarboxylic acid or ester
10 and aliphatic diol;

11 iv) cyclic amide, dicarboxylic acid or ester,
12 tricarboxylic acid or ester, and aliphatic diol;

13 v) cyclic amide and cyclic ester;

14 vi) aminocarboxylic acid, dicarboxylic acid or
15 ester and aliphatic diol;

16 vii) aliphatic diamine and/or triamine, aliphatic
17 diol, dicarboxylic acid or ester and cyclic amide;

18 viii) aliphatic polyamide and polyester;

19 ix) polymerized vegetable oil and polyester,
20 aliphatic diol or both;

21 x) aliphatic diamine and aliphatic diol;

22 xi) cyclic amide, aminocarboxylic acid, and
23 hydroxycarboxylic acid;

24 xii) cyclic amide and hydroxycarboxylic acid;

25 xiii) aliphatic polyamide and hydroxycarboxylic
26 acid;

27 xiv) cyclic amide, cyclic ester, dicarboxylic acid
28 or ester and aliphatic diol;

29 xv) a triol/diol/aliphatic dicarboxylic acid
30 crosspolymer and a
31 polyamide; and

32 xvi) triol, diol, aliphatic dicarboxylic acid and
33 a cyclic amide.

1 5. The compostable and/or degradable polymer
2 composition according to claim 4, wherein polymer (A) is
3 prepared from caprolactam and caprolactone.

1 6. The compostable and/or degradable polymer
2 composition according to claim 4, wherein polymer (A) is
3 prepared from caprolactam and lactic acid.

1 7. The compostable and/or degradable polymer
2 composition according to claim 4, wherein polymer (A) is
3 prepared from caprolactam, adipic acid, and 1,4-butanediol.

1 8. The compostable and/or degradable polymer
2 composition according to claim 4, wherein polymer (A) is
3 prepared from hexamethylenediamine, adipic acid, and 1,4-
4 butanediol.

1 9. The compostable and/or degradable polymer
2 composition according to claim 4, wherein polymer (A) is
3 prepared from polymerized vegetable oil and polyester,
4 aliphatic diol or both.

1 10. The compostable and/or degradable polymer
2 composition according to claim 4, wherein the cyclic amide
3 is caprolactam, the cyclic ester is caprolactone, the
4 dicarboxylic acid or ester is dimethylterephthalate and the
5 aliphatic diol is selected from the group consisting of
6 ethylene glycol and 1,4-butanediol.

1 11. The compostable and/or degradable polymer
2 composition according to claim 4, wherein polymer (A) is
3 prepared from the scrambling of a glycerol/diethylene
4 glycol/adipic acid crosspolymer with nylon-6.

1 12. The compostable and/or degradable polymer
2 composition according to claim 4, wherein polymer (A) is
3 prepared from glycerol, diethylene glycol, adipic acid and
4 caprolactam.

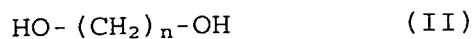
1 13. The compostable and/or degradable polymer
2 composition according to claim 10, wherein caprolactam is
3 20-90 wt%, caprolactone is 0-40 wt%; dimethylterephthalate
4 is 5-40 wt%, and ethylene glycol is 5-40 wt%.

1 14. The compostable and/or degradable polymer
2 composition according to claim 4, wherein the dicarboxylic
3 acid is selected from Formula I:



4 where n is a whole number ranging from 2 to 6.

1 15. The compostable and/or degradable polymer
2 composition according to claim 4, wherein the aliphatic diol
3 is selected from Formula II:



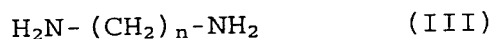
4 where n is a whole number ranging from 2 to 6.

1 16. The compostable and/or degradable polymer
2 composition according to claim 4, wherein the cyclic amide
3 is caprolactam.

1 17. The compostable and/or degradable polymer
2 composition according to claim 4, wherein the aliphatic
3 polyamide is selected from the group consisting of nylon-66
4 and polycaprolactam.

1 18. The compostable and/or degradable polymer
2 composition according to claim 4, wherein the cyclic ester
3 is selected from the group consisting of caprolactone and
4 3,6-dimethyl-1,4-dioxane-2,5-dione.

1 19. The compostable and/or degradable polymer
2 composition according to claim 4, wherein the aliphatic
3 diamine is selected from Formula III:



5 where n is a whole number ranging from 2 to 6.

1 20. The compostable and/or degradable polymer
2 composition according to claim 4, wherein the
3 aminocarboxylic acid is selected from Formula IV:



5 where n is a whole number ranging from 2 to 6.

1 21. The compostable and/or degradable polymer
2 composition according to claim 4, wherein the
3 hydroxycarboxylic acid is selected from Formula V:



5 where n is a whole number ranging from 2 to 6 and R is
6 selected from the group consisting of hydrogen, methyl and
7 ethyl.

1 22. The compostable and/or degradable polymer
2 composition according to claim 4, wherein the polyester is

3 selected from the group consisting of polycaprolactone and
4 polylactic acid.

1 23. The compostable and/or degradable polymer
2 composition according to claim 1, further comprising a
3 polyketone, polyurethane, polylactic acid, starch,
4 polyethylene glycol or mixtures thereof.

1 24. The compostable and/or degradable polymer
2 composition according to claim 1, wherein polymer (B) is a
3 polyester selected from the group consisting of polylactic
4 acid, polyhydroxyalkanoate, polyhydroxybutyrate,
5 polyhydroxy-valerate, Biopol, polycaprolactone, polyethylene
6 adipate, polyethylene succinate, polybutylene succinate,
7 polyglycolic acid and copolymers and combinations thereof.

1 25. The compostable and/or degradable polymer
2 composition according to claim 1, which includes polymer
3 (A), polymer (B), and component (D).

1 26. The compostable and/or degradable polymer
2 composition according to claim 25, wherein polymer (A) is a
3 caprolactam/caprolactone copolymer or a caprolactam/lactic
4 acid copolymer, polymer (B) is PVOH or EVOH.

1 27. The compostable and/or degradable polymer
2 composition according to claim 1, further comprising a
3 degrading aid.

1 28. The compostable and/or degradable polymer
2 composition according to claim 27, wherein the degrading aid

3 is selected from the group consisting of ammonium
4 polyphosphate and zinc pyrophosphate.

1 29. The compostable and/or degradable polymer
2 composition according to claim 27, wherein the degrading aid
3 is in a range of 0.1 - 5 wt%.

1 30. The compostable and/or degradable polymer
2 composition according to claim 1, further comprising
3 component (D) which is a crosslinking agent.

1 31. The compostable and/or degradable polymer composition
2 according to claim 30, wherein the crosslinking agent is
3 selected from the group consisting of a triamine, triol,
4 jeffamine, polyethyleneimine, multifunctional amines,
5 glycerol, sorbitol, EVOH, PVOH, triaminopyrimidines,
6 tetraazacyclo-tetradecane, tricarboxylic acid or ester,
7 tetracarboxylic acid or ester, methylene bis(4-phenyl
8 isocyanate), vinyltrimethoxysilane, diethylene glycol
9 diglycidyl ether, epichlorohydrin,
10 1,1,3,3,5,5,7,7,9,9,11,11-dodecamethyl-1,11-bis(4-
11 (oxiranylmethoxy)phenyl)-Hexasiloxane, 3-(trimethoxysilyl)-
12 1-Propanamine, zinc pyrophosphate, zinc oxide and mixtures
13 thereof.

1 32. The compostable and/or degradable polymer
2 composition according to claim 30, wherein the crosslinking
3 agent is selected from the group consisting of

4 3,3-dimethoxy-7,9-dimethyl-7-((nonamethyltetra-
5 siloxanyl)oxy))-9-((trimethylsilyl)oxy)-2,8,13-trioxa-3,7,9-
6 trisilapentadecan-15-ol;

7 1,1,1,3,3,5,5,7,7,9,11,13,15,17,19,19,

8 19-heptadecamethyl-9,11,13,15,17-pentakis(2-(7-

9 oxabicyclo(4.1.0)hept-3-yl)ethyl)-decasiloxane;

10 poly(oxy(1,1,3,3,5,5,7,7-octamethyl-1,7-tetrasiloxane-

11 diyl)oxy-1,3-phenylene(phenylimino)(1,1'-biphenyl)-4,4'-

12 diyl(phenylimino)-1,3-phenylene);

13 1,1,3,3,5,5,7,7-octamethyl-1,7-tetrasiloxanediol

14 diacetate;

15 alpha-(nonamethyltetrasiloxanyl)-omega-((trimethyl-

16 silyl)oxy)-poly(oxy(((diethylamino)oxy)methylsilylene));

17 dodecamethyl pentasiloxane;

18 alpha-(nonamethyltetrasiloxanyl)-omega-

19 ((trimethylsilyl)oxy)-poly(oxy(((diethylamino)oxy)methyl-

20 silylene))),;

21 1,1,3,3,5,5,7,7,9,9-decamethyl-1,9-pentasiloxanediol;

22 1,1,3,3,5,5,7,7,9,9-decamethyl-1,9-bis(4-(oxiranyl-

23 methoxy)phenyl)-pentasiloxane;

24 1,1,3,3,5,5,7,7,9,9,11,11-dodecamethyl-1,11-bis(4-

25 (oxiranylmethoxy)phenyl)-hexasiloxane;

26 1,1,3,3,5,5,7,7,9,9,11,11,13,13,15,15-hexadecamethyl-

27 1,15-bis(4-(oxiranylmethoxy)phenyl)-octasiloxane;

28 1,1,3,3,5,5,7,7,9,9,11,11,13,13,15,15,17,17-octadeca-

29 methyl-1,17-bis(4-(oxiranylmethoxy)phenyl)-nonasiloxane;

30 1,1,3,3,5,5,7,7,9,9,11,11,13,13,15,15,17,17,19,19,21,21

31 ,23,23-tetracosamethyl-1,23-bis(4-(oxiranylmethoxy)phenyl)-

32 dodecasiloxane;

33 4,4'-(1,1,3,3,5,5,7,7,9,9-decamethyl-1,9-

34 pentasiloxanediyl)bis-phenol;

35 4,4'-(1,1,3,3,5,5,7,7,9,9,11,11-dodecamethyl-1,11-

36 hexasiloxanediyl)bis-phenol;

37 4,4'-(1,1,3,3,5,5,7,7,9,9,11,11,13,13,15,15-

38 hexadecamethyl-1,15-octasiloxanediyl)bis-phenol;

39 4,4'-(1,1,3,3,5,5,7,7,9,9,11,11,13,13,15,15,17,17-
40 octadecamethyl-1,17-nonasiloxanediyl)bis-phenol;
41 4,4'-(1,1,3,3,5,5,7,7,9,9,11,11,13,13,15,15,17,17,
42 19,19,21,21,23,23-tetracosamethyl-1,23-dodecasiloxane-
43 diyl)bis-phenol;
44 1,1,3,3,5,5,7,7-octamethyl-1,7-tetrasiloxanediol;
45 1-ethenyl-1,3,3,5,5,7,7-heptamethyl-1,7-tetrasiloxane-
46 diol;
47 1,1,3,3,5,5-hexamethyl-7,7-diphenyl-1,7-tetrasiloxane-
48 diol;
49 1,1,3,3,5,5,7-heptamethyl-7-(3,3,3-trifluoropropyl)-
50 1,7-tetrasiloxanediol;
51 1,1,3,3,5,5,7-heptamethyl-7-phenyl-1,7-tetrasiloxane-
52 diol;
53 N,N'-(1,1,3,3,5,5,7,7,9,9,11,11-dodecamethyl-1,11-
54 hexasiloxanediyl)di-3,1-propanediyl)bis(N-(oxiranylmethyl)-
55 oxiranemethanamine;
56 1,1,3,3,5,5,7,7,9,9,11,11,13,13,15,15,17,17,19,19-
57 eicosamethyl-1,19-bis(4-(methyl-1-(4-
58 oxiranylmethoxy)phenyl)ethyl)phenoxy)-decasiloxane; and
59 1,1,3,3,5,5-hexamethyl-1,5-bis(4-(1-methyl-1-(4-
60 (oxiranylmethoxy)phenyl)ethyl)phenoxy)-trisiloxane.

1 33. The compostable and/or degradable polymer
2 composition according to claim 31, wherein the crosslinking
3 agent is selected from the group consisting of zinc
4 pyrophosphate, zinc oxide and mixtures thereof.

1 34. The compostable and/or degradable polymer
2 composition according to claim 30, wherein the crosslinking
3 agent is incorporated at a level of 0.0 to 2.0 wt percent.

1 35. The compostable and/or degradable polymer
2 composition according to claim 1, further comprising
3 component (E) which is a polymer end-capped with functional
4 groups.

1 36. The compostable and/or degradable polymer
2 composition according to claim 35, wherein component (E) is
3 selected from the group consisting of polyether diol,
4 polysilylalcohol, polyesteramidepolyols, polyurethane-
5 polyols, hydroxylated acrylate resins, polyester diols,
6 aminopropyl-terminated polyethylene glycol, aminopropyl-
7 terminated polypropylene glycol, end-capped methacrylate
8 functionalized polyethyleneglycol and epichlorohydrin
9 derivatized polyethylene glycol.

1 37. The compostable and/or degradable polymer
2 composition according to claim 35, wherein the polyether
3 diol is selected from the group consisting of polyethylene
4 glycol, polyethylene ether glycol, polypropylene ether
5 glycol, polytetramethylene ether glycol, polyhexamethylene
6 ether glycol.

1 38. The compostable and/or degradable polymer
2 composition according to claim 35, wherein component (E) has
3 a molecular weight of 600 to 4000 dalton.

1 39. The compostable and/or degradable polymer
2 composition, according to claim 1, having a spherulitic form
3 wherein the spherulites average particle diameter ranges
4 from 100-500 μm .

1 40. The compostable and/or degradable polymer
2 composition, according to claim 1, where in polymer (B) is
3 in a range of 1 to 60 wt% of the total composition and is
4 selected from the group consisting of starch, starch
5 derivative, cellulose, chitin, amylose, amylopectin and
6 mixtures thereof.

1 41. The compostable and/or degradable polymer
2 composition according to claim 1, wherein polymer (A) is
3 prepared from caprolactam and caprolactone and polymer (B)
4 is polyvinyl alcohol.

1 42. The compostable and/or degradable polymer
2 composition according to claim 1, wherein the plasticizer
3 component (C) is selected from the group consisting of
4 polyethylene glycol, polypropylene glycol, polyethylene
5 propylene glycol, glycerol, butenediol, propylene glycol,
6 sorbitol, glycerol triacetate, methyl ricinolate, dihexyl
7 phthalate, low molecular weight polycaprolactone diol or
8 triol, acetyl-tri-n-butyl citrate, and combinations thereof.

1 43. A method for preparing a compostable and/or
2 degradable polymer composition, comprising combining polymer
3 (A) which is a polyesteramide copolymer with at least one of
4 polymer (B) and component (D);

5 wherein polymer (B) which is at least one polymer
6 selected from the group consisting of polyethylenevinyl
7 alcohol, polyvinyl alcohol, polyester, starch, starch
8 derivative, cellulose, polyethylene glycol, chitin, amylose,
9 amylopectin, starch derivatized with ethyleneimine,
10 cellulose derivatized with ethyleneimine, polysaccharides
11 derivatized with ethyleneimine, lignin derivatized with

12 ethyleneimine, farinaceous materials derivatized with
13 ethyleneimine and mixtures thereof;
14 component (D) which is a crosslinking agent;
15 in an amount necessary to have up to 60 wt% of polymer
16 (B) and up to 5 wt% of component (D);
17 wherein all wt% values are based upon the total weight
18 of the polymer composition.

1 44. The method for preparing a compostable and/or
2 degradable polymer composition according to claim 43,
3 further comprising the step of preparing polymer (A) by
4 combining at least one of the following sets of reactants:
5 i) cyclic amide, dicarboxylic acid or ester and
6 aliphatic diol;
7 ii) aliphatic polyamide and a cyclic ester, a diol
8 or both;
9 iii) aliphatic diamine, dicarboxylic acid or ester
10 and aliphatic diol;
11 iv) cyclic amide, dicarboxylic acid or ester,
12 tricarboxylic acid or ester, and aliphatic diol;
13 v) cyclic amide and cyclic ester;
14 vi) aminocarboxylic acid, dicarboxylic acid or
15 ester and aliphatic diol;
16 vii) aliphatic diamine and/or triamine, aliphatic
17 diol, dicarboxylic acid or ester and cyclic amide;
18 viii) aliphatic polyamide and polyester;
19 ix) polymerized vegetable oil and polyester,
20 aliphatic diol or both;
21 x) aliphatic diamine and aliphatic diol;
22 xi) cyclic amide, aminocarboxylic acid, and
23 hydroxycarboxylic acid
24 xii) cyclic amide and hydroxycarboxylic acid;

- 25 xiii) aliphatic polyamide and hydroxycarboxylic
26 acid;
27 xiv) cyclic amide, cyclic ester, dicarboxylic acid
28 or ester and aliphatic diol;
29 xv) a triol/diol/aliphatic dicarboxylic acid
30 crosspolymer and a
31 polyamide; and
32 xvi) triol, diol, aliphatic dicarboxylic acid and
33 a cyclic amide.

1 45. The method for preparing a compostable and/or
2 degradable polymer composition according to claim 43,
3 wherein polymer (A) is prepared by melting an aliphatic
4 polyamide and blending at least one hydroxycarboxylic acid
5 selected from Formula V:



6
7 where n is a whole number ranging from 2 to 6 and R is
8 selected from the group consisting of hydrogen, methyl and
9 ethyl.

1 46. The method for preparing a compostable and/or
2 degradable polymer composition according to claim 43,
3 wherein polymer (A) is prepared by melting an aliphatic
4 polyamide and either a polyester or cyclic ester together
5 and mixing for greater than one minute in the melt.

1 47. The method for preparing a compostable and/or
2 degradable polymer composition according to claim 43,
3 wherein the preparation of polymer (A) further comprises
4 adding tin octoate to the melted mixture.

1 48. The method for preparing a compostable and/or
2 degradable polymer composition according to claim 43,
3 wherein polymer (A) is prepared by combining a cyclic amide,
4 a cyclic ester, and an anionic catalyst.

1 49. The method for preparing a compostable and/or
2 degradable polymer composition according to claim 48,
3 wherein the cyclic amide ranges from 90 wt% to 20 wt% and
4 the cyclic ester ranges from 10 wt% and 80 wt%.

1 50. The method for preparing a compostable and/or
2 degradable polymer composition according to claim 48,
3 wherein the anionic catalyst varies between 20-5,000 ppm.

1 51. The method for preparing a compostable and/or
2 degradable polymer composition according to claim 48,
3 wherein the anionic catalyst is sodium methoxide and/or the
4 sodium salt of caprolactam.

1 52. The method for preparing a compostable and/or
2 degradable polymer composition according to claim 43,
3 wherein polymer (A) is prepared by combining a cyclic amide,
4 a cyclic ester, and water.

1 53. The method for preparing a compostable and/or
2 degradable polymer composition according to claim 52,
3 wherein the cyclic amide ranges from 98 wt% to 20 wt% and
4 the cyclic ester ranges from 2 wt% and 80 wt%.

1 54. The method for preparing a compostable and/or
2 degradable polymer composition according to claim 52,
3 wherein the amount of water ranges from 1-3 wt%.

1 55. The method for preparing a compostable and/or
2 degradable polymer composition according to claim 43, which
3 includes a crosslinking agent.

1 56. The method for preparing a compostable and/or
2 degradable polymer composition according to claim 55,
3 wherein the crosslinking agent is selected from the group
4 consisting of a triamine, triol, jeffamine,
5 polyethyleneimine, multifunctional amines, glycerol,
6 sorbitol, EVOH, PVOH, triaminopyrimidines, tetraazacyclo-
7 tetradecane, tricarboxylic acid or ester, tetracarboxylic
8 acid or ester, methylene bis(4-phenyl isocyanate),
9 vinyltrimethoxysilane, diethylene glycol diglycidyl ether,
10 epichlorohydrin, 1,1,3,3,5,5,7,7,9,9,11,11-dodecamethyl-
11 1,11-bis(4-(oxiranylmethoxy)phenyl)-Hexasiloxane, 3-
12 (trimethoxysilyl)-1-Propanamine, zinc pyrophosphate, zinc
13 oxide and mixtures thereof.

1 57. The method for preparing a compostable and/or
2 degradable polymer composition according to claim 55,
3 wherein the crosslinking agent is selected from the group
4 consisting of 3,3-dimethoxy-7,9-dimethyl-7-
5 ((nonamethyltetrasiloxanyl)oxy))-9-((trimethylsilyl)oxy)-
6 2,8,13-Trioxa-3,7,9-trisilapentadecan-15-ol;
7 1,1,1,3,3,5,5,7,7,9,11,13,15,17,19,19,19-heptadecamethyl-
8 9,11,13,15,17-pentakis(2-(7-oxabicyclo(4.1.0)hept-3-
9 yl)ethyl)Decasiloxane,; Poly(oxy(1,1,3,3,5,5,7,7-octamethyl-
10 1,7-tetrasiloxanediyl)oxy-1,3-phenylene(phenylimino)(1,1'-
11 biphenyl)-4,4'-diyl(phenylimino)-1,3-phenylene);
12 1,1,3,3,5,5,7,7-octamethyl-1,7-Tetrasiloxanediol,
13 diacetate; α -(nonamethyltetrasiloxanyl)- γ -

14 ((trimethylsilyl)oxy) -
15 poly(oxy(((diethylamino)oxy)methylsilylene)); dodecamethyl-
16 pentasiloxane; α -(nonamethyltetrasiloxanyl) - γ -
17 ((trimethylsilyl)oxy) -
18 poly(oxy(((diethylamino)oxy)methylsilylene));
19 1,1,3,3,5,5,7,7,9,9-decamethyl-1,9-pentasiloxanediol;
20 1,1,3,3,5,5,7,7,9,9-decamethyl-1,9-bis(4-
21 (oxiranylmethoxy)phenyl) - pentasiloxane;
22 1,1,3,3,5,5,7,7,9,9,11,11-dodecamethyl-1,11-bis(4-
23 (oxiranylmethoxy)phenyl) - hexasiloxane;
24 1,1,3,3,5,5,7,7,9,9,11,11,13,13,15,15-hexadecamethyl-1,15-
25 bis(4-(oxiranylmethoxy)phenyl) - octasiloxane;
26 1,1,3,3,5,5,7,7,9,9,11,11,13,13,15,15,17,17-octadecamethyl-
27 1,17-bis(4-(oxiranylmethoxy)phenyl) - nonasiloxane;
28 1,1,3,3,5,5,7,7,9,9,11,11,13,13,15,15,17,17,19,19,21,21,23,2
29 3-tetracosamethyl-1,23-bis(4-(oxiranylmethoxy)phenyl) -
30 dodecasiloxane; 4,4'-(1,1,3,3,5,5,7,7,9,9-decamethyl-1,9-
31 pentasiloxanediyl)bis-phenol; 4,4'-
32 (1,1,3,3,5,5,7,7,9,9,11,11-dodecamethyl-1,11-
33 hexasiloxanediyl)bis-phenol; 4,4'-
34 (1,1,3,3,5,5,7,7,9,9,11,11,13,13,15,15,17,17-octadecamethyl-
35 1,17-nonasiloxanediyl)bis-phenol; 4,4'-
36 (1,1,3,3,5,5,7,7,9,9,11,11,13,13,15,15,17,17,19,19,21,21,23,
37 23-tetracosamethyl-1,23-dodecasiloxanediyl)bis-phenol;
38 1,1,3,3,5,5,7,7-octamethyl-1,7-tetrasiloxanediol; 1-
39 ethenyl-1,3,3,5,5,7,7-heptamethyl-1,7-tetrasiloxanediol;
40 1,1,3,3,5,5-hexamethyl-7,7-diphenyl-1,7-tetrasiloxanediol;
41 1,1,3,3,5,5,7-heptamethyl-7-(3,3,3-trifluoropropyl)-1,7-
42 tetrasiloxanediol; 1,1,3,3,5,5,7-heptamethyl-7-phenyl-1,7-
43 tetrasiloxanediol;

46 N,N'-(1,1,3,3,5,5,7,7,9,9,11,11-dodecamethyl-1,11-
 47 hexasiloxanediyl)di-3,1-propanediyl)bis(N-(oxiranylmethyl)-
 48 oxiranemethanamine;
 49 1,1,3,3,5,5,7,7,9,9,11,11,13,13,15,15,17,17,19,19-
 50 eicosamethyl-1,19-bis(4-(methyl-1-(4-
 51 oxiranylmethoxy)phenyl)ethyl)phenoxy)-decasiloxane; and
 52 1,1,3,3,5,5-hexamethyl-1,5-bis(4-(1-methyl-1-(4-
 53 (oxiranylmethoxy)phenyl) ethyl)phenoxy)-trisiloxane.

1 58. The method for preparing a compostable and/or
 2 degradable polymer composition according to claim 56,
 3 wherein the crosslinking agent is selected from the group
 4 consisting of zinc pyrophosphate, zinc oxide and mixtures
 5 thereof.

1 59. The method for preparing a compostable and/or
 2 degradable polymer composition according to claim 55,
 3 wherein the crosslinking agent is incorporated at a level of
 4 0.0 to 2.0 weight percent.

1 60. The method for preparing a compostable and/or
 2 degradable polymer composition according to claim 43,
 3 further comprising component (E) which is a polymer end-
 4 capped with functional groups.

1 61. The method for preparing a compostable and/or
 2 degradable polymer composition according to claim 60,
 3 wherein component (E) is selected from the group consisting
 4 of polyether diol, polysilylalcohol, polyesteramidepolyols,
 5 polyurethanepolyols, hydroxylated acrylate resins, polyester
 6 diols, aminopropyl-terminated polyethylene glycol,
 7 aminopropyl-terminated polypropylene glycol, end-capped

8 methacrylate functionalized polyethyleneglycol and
9 epichlorohydrin derivatized polyethylene glycol.

1 62. The method for preparing a compostable and/or
2 degradable polymer composition according to claim 61,
3 wherein the polyether diol is selected from the group
4 consisting of polyethylene glycol, polyethylene ether
5 glycol, polypropylene ether glycol, polytetramethylene ether
6 glycol, polyhexamethylene ether glycol,.

1 63. The method for preparing a compostable and/or
2 degradable polymer composition according to claim 62,
3 wherein component (E) has a molecular weight of 600 to 4000
4 dalton.

1 64. The method for preparing a compostable and/or
2 degradable polymer composition according to claim 43,
3 wherein polymer (B) is a polylactic acid in a range of 1 to
4 60 wt% of the total composition.

1 65. The method for preparing a compostable and/or
2 degradable polymer composition according to claim 43,
3 wherein polymer (B) is a polyhydroxyalkanoate in a range of
4 1 to 60 wt% of the total composition.

1 66. The method for preparing a compostable and/or
2 degradable polymer composition according to claim 43,
3 wherein polymer (B) is in a range of 1 to 60 wt% of the
4 total composition and is selected from the group consisting
5 of starch, starch derivative, cellulose, chitin, amylose,
6 amylopectin and mixtures thereof.

1 67. The method for preparing a compostable and/or
2 degradable polymer composition according to claim 43,
3 wherein polymer (A) is polycaprolactam and polymer (B) is
4 polyvinyl alcohol.

1 68. The method for preparing a compostable and/or
2 degradable polymer composition according to claim 43,
3 wherein the cyclic amide is caprolactam, the cyclic ester is
4 caprolactone, the dicarboxylic acid or ester is
5 dimethylterephthalate and the aliphatic diol is selected
6 from the group consisting of ethylene glycol and 1,4-
7 butanediol.

1 69. The method for preparing a compostable and/or
2 degradable polymer composition according to claim 62,
3 wherein caprolactam is 20-90 wt%, caprolactone is 0-40 wt%;
4 dimethylterephthalate is 5-40 wt%, and ethylene glycol is 5-
5 40 wt%.

1 70. A compostable, degradable film comprising the
2 polymer composition of claim 1.

1 71. A compostable, degradable injection molded article
2 comprising the polymer composition of claim 1.

1 72. A degradable monofilament comprising the polymer
2 composition of claim 1.

1 73. A compostable, degradable fiber comprising the
2 polymer composition of claim 1.

1 74. A disposable article comprising the polymer
2 composition of claim 1.

1 75. A compostable, degradable manufactured article
2 comprising the polymer composition of claim 1.

1 76. A compostable, degradable manufactured article
2 according to claim 75 which is in the form of a sphere
3 having a diameter of between 1 micron and 50 cm and a skin
4 thickness ranging from 0.01 micron to 2.0 mm.

1 77. A method for preparing a compostable and/or
2 degradable sphere comprising forming a film of the
3 compostable and/or degradable polymer composition according
4 to claim 1 across an orifice, applying a blowing fluid at a
5 positive pressure on an inner surface of the film and
6 blowing the film to expand the film through the orifice and
7 applying an external pulsating or fluctuating pressure field
8 having periodic oscillations on an outer surface of the
9 blown film, and detaching the sphere from said orifice.

1 78. The method according to claim 77, wherein the film
2 of the compostable and/or degradable polymer composition has
3 a viscosity of 0.10 to 600 poises.

1 79. The method according to claim 77, wherein the
2 film of the compostable and/or degradable polymer
3 composition has a viscosity of 0.5 to 100 poises.

1 80. The method according to claim 77, wherein the
2 film of the compostable and/or degradable polymer
3 composition has a viscosity of 100 to 400 poises.

1 81. The method according to claim 77, wherein the
2 blowing fluid is a gas at a pressure of less than 500
3 p.s.i.g.

1 82. The method according to claim 77, wherein said
2 blowing fluid is a solution containing an organic compound
3 or salt thereof.

1 83. The method according to claim 77, wherein the
2 blowing fluid is an organic compound or salt thereof in the
3 melt phase.

1 84. The method according to claim 83, wherein said
2 blowing fluid is a polymer in the melt phase.

1 85. The method according to claim 77 wherein said
2 blowing fluid blows said film downwardly through the orifice
3 and outwardly to form an elongated cylinder shaped liquid
4 film which closes at the orifice.

1 86. The method according to claim 77, wherein said
2 orifice is on a coaxial nozzle having an orifice, an inner
3 nozzle and an outer nozzle and the external pulsating or
4 fluctuating pressure field having periodic oscillations is
5 caused by an entraining fluid, the film is formed across the
6 orifice of the outer nozzle, the blowing gas is conveyed to
7 the inner surface of the film through said inner nozzle, the
8 entraining fluid passes over and around said coaxial nozzle
9 to dynamically induce separation of the sphere from the
10 coaxial nozzle.

1 87. The method according to claim 77, wherein the film
2 of the compostable and/or degradable polymer composition
3 becomes isotropically oriented during formation of the
4 sphere.

1 88. The method according to claim 77, wherein the
2 sphere ranges in size from 1.0 micron to 50 cm in diameter.

1 89. The method according to claim 87, wherein the
2 polymer is oriented isotropically by expanding the film
3 between the glass transition temperature and the melting
4 temperature.

1 90. A compostable and/or degradable sphere prepared by
2 the method of claim 88.

1 91. The compostable and/or degradable sphere according
2 to claim 90, wherein the compostable and/or degradable
3 polymer is prepared by combining 3-8 weight% of a
4 polyesteramide consisting of 20-40% ester units and having a
5 melting point of less than 190 °C with 92-97 weight% of
6 undried starch.

1 92. The compostable and/or degradable sphere according
2 to claim 90, wherein the compostable and/or degradable
3 polymer is prepared by combining 40-70 weight% of a
4 polyesteramide consisting of 2-80% ester units with 30-60
5 weight% of polyvinylalcohol and/or polyethylenevinyl
6 alcohol, and wherein the sphere has a diameter of 2.0-6.0
7 cm.

1 93. A method of strengthening paper comprising coating
2 the paper with the compostable and/or degradable sphere of
3 claim 90.

1 94. A method of strengthening paper comprising coating
2 the paper with a sphere composed of polyethylene,
3 polypropylene, or polylactic acid.

1 95. The compostable and/or degradable polymer
2 composition according to claim 1, further comprising at
3 least one of sugar, peanut butter or soybean oil to attract
4 insects.

1 96. A compostable and/or degradable polymer
2 composition, comprising:
3 polylactic acid;
4 polymer (B) which is at least one polymer selected from
5 the group consisting of polyethylenevinyl alcohol, polyvinyl
6 alcohol, polyester, starch, starch derivative, cellulose,
7 polyethylene glycol, chitin, amylose, amylopectin, starch
8 derivatized with ethyleneimine, cellulose derivatized with
9 ethyleneimine, polysaccharides derivatized with
10 ethyleneimine, lignin derivatized with ethyleneimine,
11 farinaceous materials derivatized with ethyleneimine and
12 mixtures thereof;

13 component (C) which is a plasticizer; and

14 component (D) which is a crosslinking agent;

15 wherein the polymer composition comprises 0 to 60 wt%
16 of polymer (B), 0 to 25 wt% of component (C), and 0 to 5 wt%
17 of component (D);

18 wherein all wt% values are based upon the total weight
19 of the polymer composition; and

20 with the proviso that the polymer composition must
21 contain at least one of polymer (B) and component (D).